

Jared Saia

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Research Interests

Theory and algorithms, including security, distributed computing and game theory. A strong current interest is determining how large networks of unreliable components can function reliably.

Education

Ph.D., Computer Science and Engineering, University of Washington, June 2002.
Thesis: “Algorithms for Managing Data in Distributed Systems,” advised by Prof. Anna Karlin.

B.S., Computer Science, Stanford University, June 1993.

Employment

2002-present. Department of Computer Science, The University of New Mexico. Associate Chair, 2011-2014; Full Professor, 2013-present; Associate Professor, 2008-2013; Assistant Professor, 2002-2008.

July 2016 - August 2016. Graduate School of Information Science, Nagoya University, Nagoya, Japan. Visiting Professor (sabbatical leave).

June 2015 - August 2015. Computer Science Department, Aarhus University, Aarhus, Denmark. Visiting Professor (sabbatical leave).

August 2008 - December 2008. Department of Information Systems, Polytechnic University of Catalonia, Barcelona, Spain. Visiting Associate Professor (sabbatical leave).

December 2008 - May 2009. Department of Computer Science, Sapienza University of Rome, Rome Italy. Visiting Associate Professor (sabbatical leave).

1993-1994. Advanced Telephony Research Labs, Nara, Japan. Visiting Researcher.

Awards and Honors

Best Paper Award, International Colloquium on Structural Information and Communication Complexity (SIROCCO), 2020.

“Highlighted Paper” (1 of 4), at International Conference on Distributed Computing and Networking (ICDCN), 2020.

Best Paper Award, International Conference on Distributed Computing and Networking (ICDCN), 2014.

Nominated for UNM Outstanding Teacher of the Year, 2014.

Senior Faculty Research Excellence Award, School of Engineering, University of New Mexico, 2011.

Nominated for UNM Outstanding Teacher of the Year, 2011.

Best Paper Award, Principles of Distributed Computing (PODC), 2010.

NSF Faculty Early Career Award, 2006.

Junior Faculty Research Excellence Award, School of Engineering, University of New Mexico, 2007.

Best Paper Award, Japanese Society for Artificial Intelligence (JSAI), 1995.

Publications

Note: Former and current students and post docs are indicated in boldface in the author lists. Total citations to these publications number over 3,400, with an h-index of 27. Note: In theory conferences and journals, author names are in alphabetical order.

Journals

1. Jonathan Berry, Cynthia A Phillips, and Jared Saia. “Making social networks more human: A topological approach”, *Statistical Analysis and Data Mining: The ASA Data Science Journal* 12(6):449-464, 2019.
2. **Varsha Dani**, Thomas Hayes, **Mahnush Movahedi**, Jared Saia and Maxwell Young, “Interactive communication with unknown noise rate”, *Journal of Information and Computation*, 2018.
3. Dan Alistarh, James Aspnes, Valerie King, and Jared Saia, “Communication-Efficient Randomized Consensus”, *Journal of Distributed Computing* 31(6): 489-501, 2018.
4. Valerie King, Seth Pettie, Jared Saia, Maxwell Young, “A resource-competitive jamming defense”, *Journal of Distributed Computing* 31(6): 419-439, 2018.
5. **Varsha Dani**, Valerie King, **Mahnush Movahedi**, Jared Saia, and **Zamani, Mahdi**, “Secure Multi-party Computation in Large Networks”, *Journal of Distributed Computing* 30(3): 193-229, 2017.
6. **George Saad** and Jared Saia, “A Theoretical and Empirical Evaluation of an Algorithm for Self-healing Computation”, *Journal of Distributed Computing* 30(6): 391-412, 2017.
7. Valerie King and Jared Saia, “Byzantine Agreement in Expected Polynomial Time”, *Journal of the ACM (JACM)* 63(2): 1-21, 2016.
8. **Varsha Dani**, **Mahnush Mohavedi** and Jared Saia, “Scalable Mechanisms for Rational Secret Sharing”, *Journal of Distributed Computing*, 2014.
9. Amos Fiat, Stefano Leonardi, Jared Saia and Piotr Sankowski, “Single Valued Combinatorial Auctions with Budgets,” *ACM Transactions on Economics and Computation*, 2013.
10. Tom Hayes, Jared Saia, **Amitabh Trehan**, “The Forgiving Graph: A distributed data structure for low stretch under adversarial attack,” *Journal of Distributed Computing* 25(4): 261-72, 2012.
11. Valerie King and Jared Saia, “Breaking the $O(n^2)$ Bit Barrier: Scalable Byzantine agreement with an Adaptive Adversary,” *Journal of the ACM* 58(4): 1-18, 2011.
12. Valerie King, Cynthia Phillips, Jared Saia and **Maxwell Young**, “Sleeping on the Job: Energy-Efficient Broadcast for Radio Networks,” *Algorithmica* 61(3): 518-554, 2011.

13. Therese Biedl, Shuang Luan, Stephane Durocher, Jared Saia, Holger H. Hoos, **Maxwell Young**, “A Note on Improving the Performance of Approximation Algorithms for Radiation Therapy,” *Information Processing Letters (IPL)* 111(7): 326-333, 2011.
14. Habiba, **Yintao Yu**, Tanya Berger-Wolf and Jared Saia, “Finding Spread Blockers in Dynamic Networks,” *Advances in Social Network Mining and Analysis, Springer Lecture Notes in Computer Science* 5498: 55-76, 2010.
15. Bruce Kapron, David Kempe, Valerie King, Jared Saia and **Vishal Sanwalani**, “Fast asynchronous Byzantine agreement and leader election with full information,” *ACM Transactions on Algorithms (TALG)* 6(4): 1-28, 2010. (**Invited issue of best papers from SODA 2008**)
16. Eric Anderson, Joe Hall, Jason Hartline, Michael Hobbes, Anna Karlin, Jared Saia, Ram Swaminathan and John Wilkes, “Algorithms for Data Migration,” *Algorithmica* 57(2): 349-380, 2010.
17. Jared Saia and **Maxwell Young**, “Reducing Communication Costs in Robust Peer-to-Peer Networks,” *Information Processing Letters (IPL)*, 106(4): 152-158, 2008.
18. Valerie King, **Scott Lewis**, Jared Saia, and **Maxwell Young**, “Choosing a Random Peer in Chord,” *Algorithmica* 49(2): 147-169, 2007.
19. Amos Fiat and Jared Saia, “Censorship Resistant Peer-to-peer Networks,” *Theory of Computing (TOC)* 3(1): 1-23, 2007. (**Invited issue of best papers from SODA 2002**)
20. Shuang Luan, Jared Saia, and **Maxwell Young**, “Approximation Algorithms for Minimizing Segments in Radiation Therapy,” *Information Processing Letters (IPL)* 101(6): 239-244, 2007.
21. Michael Collins, David Kempe, Jared Saia and **Maxwell Young**, “Nonnegative Integral Subset Representations of Integer Sets,” *Information Processing Letters (IPL)* 101(3): 129-133, 2007.
22. Tanya Berger-Wolf, Cris Moore and Jared Saia, “A Computational Approach to Animal Breeding,” *Journal of Theoretical Biology* 244(3): 433-439, 2007.
23. Tanya Berger-Wolf, William Hart and Jared Saia, “Discrete Sensor Placement Problems in Distribution Networks,” *Journal of Mathematical and Computer Modeling* 42(13): 1385-1396, 2005.
24. Tracy Kimbrel and Jared Saia, “Online and Offline Preemptive Two-Machine Job Shop Scheduling,” *Journal of Scheduling* 3(6): 355-364, 2000.
25. Ezra Black, Stephen Eubank, Hideki Kashioka, Jared Saia “Reinventing Part-of-Speech Tagging,” *Journal of Natural Language Processing (Japan)*, 5(1): 3-24, 1998.

Conferences and Workshops

26. **Diksha Gupta**, Jared Saia, Maxwell Young, “Bankrupting Sybil Despite Churn”, *International Conference on Distributed Computing Systems (ICDCS)*, 2021.
27. John Augustine, Valerie King, Anisur Rahaman Molla, Gopal Pandurangan, and Jared Saia, “Scalable and Secure Computation Among Strangers: Message-Competitive Byzantine Protocols”, *Symposium on Distributed Computing (DISC)*, 2020.
28. **Diksha Gupta**, Jared Saia, Maxwell Young, “Resource Burning for Permissionless Systems”, Invited Paper at *International Colloquium on Structural Information and Communication Complexity (SIROCCO)*, 2020.
29. **Abhinav Aggarwal** and Jared Saia, “ANTS on a Plane”, *International Colloquium on Structural Information and Communication Complexity (SIROCCO)*, 2020. **Best Paper Award**

30. **Abhinav Aggarwal**, Varsha Dani, Thomas P Hayes, and Jared Saia, “A scalable algorithm for multiparty interactive communication with private channels” , *International Conference on Distributed Computing and Networking (ICDCN)*, 2020. **One of 4 “Highlighted Papers” in the distributed-computing track**
31. **Diksha Gupta**, Jared Saia, and Maxwell Young, “Peace through superior puzzling: An asymmetric Sybil defense” , *IEEE Parallel and Distributed Processing Symposium (IPDPS)*, 2019.
32. **Abhinav Aggarwal**, **Varsha Dani**, Thomas P. Hayes and Jared Saia, “Multiparty interactive communication with private channels” , *Principles of Distributed Computing (PODC)*, 2019.
33. **Abhinav Aggarwal**, Mahnush Movahedi, Jared Saia, and Mahdi Zamani, “Bootstrapping public blockchains without a trusted setup” , *Principles of Distributed Computing (PODC)*, 2019.
34. **Abhinav Aggarwal**, William F Vining, **Diksha Gupta**, Jared Saia, and Melanie E Moses, “A most irrational foraging algorithm” , *Principles of Distributed Computing (PODC)*, 2019.
35. Mercy Jaiyeola, Kyle Patron, Jared Saia, Maxwell Young, and Qian M. Zhou, “Tiny Groups Tackle Byzantine Adversaries” , *IEEE Parallel and Distributed Processing Symposium (IPDPS)*, 2018.
36. **Diksha Gupta**, Jared Saia, and Maxwell Young, “Proof of Work Without All the Work” , *International Conference on Distributed Computing and Networking (ICDCN)*, 2018.
37. **Abhinav Aggarwal**, **Varsha Dani**, Thomas P. Hayes, and Jared Saia, “Sending a Message with Unknown Noise” , *International Conference on Distributed Computing and Networking (ICDCN)*, 2018.
38. **Mahdi Zamani**, Jared Saia, and Jedidiah Crandall, “TorBricks: Blocking-Resistant Tor Bridge Distribution” , *Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*, 2017.
39. **Mahnush Movahedi**, Jared Saia, and **Mahdi Zamani**, “Shuffle to Baffle: Towards Scalable Protocols for Secure Multi-party Shuffling” , *International Conference on Distributed Computing Systems (ICDCS)*, 2015.
40. **Mahnush Movahedi**, Jared Saia, **Mahdi Zamani**, “Secure Multi-party Shuffling” , *Colloquium on Structural Information and Communication Complexity (SIROCCO)*, 2015.
41. Jonathan Berry, Michael Collins, **Aaron Kearns**, Cynthia Phillips, Jared Saia, and Randy Smith, “Cooperative Computing for Autonomous Data Centers” , *IEEE Parallel and Distributed Processing Symposium (IPDPS)*, 2015.
42. Jared Saia and **Mahdi Zamani**, “Recent Results in Scalable Multi-party Computation” , *Current Trends in Theory and Practice of Computing (SOFSEM)*, 2015.
43. Seth Gilbert, Valerie King, Seth Pettie, Ely Porat, Jared Saia, and **Maxwell Young**, “(Near) Optimal Resource-Competitive Broadcast with Jamming” , *Symposium on Parallelism in Algorithms and Architectures (SPAA)*, 2014.
44. Dan Alistarh, James Aspnes, Valerie King and Jared Saia, “Communication-Efficient Randomized Consensus” , *International Symposium on Distributed Computing (DISC)*, 2014.
45. **Mahnush Movahedi**, Jared Saia and **Mahdi Zamani**, “Secure Anonymous Broadcast (Brief Announcement)” , *International Symposium on Distributed Computing (DISC)*, 2014.
46. **George Saad** and Jared Saia, “Self-Healing Computation” , *Proceedings of the 16th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*, 2014.
47. Valerie King and Jared Saia, “Faster Agreement Via a Spectral Method for Detecting Malicious Behavior” *Symposium on Discrete Algorithms (SODA)*, 2014.

48. **Varsha Dani**, Valerie King, **Mahnush Movahedi** and Jared Saia, “Quorums Quicken Queries: Efficient Asynchronous Secure Multiparty Computation” *International Conference on Distributed Computing and Networking (ICDCN)*, 2014. **Best Paper Award, Distributed Computing Track**
49. Valerie King and Jared Saia, “Byzantine Agreement in Polynomial Expected Time” *Symposium on Theory of Computing (STOC)*, 2013. **Invited to a special issue of SICOMP for selected papers from STOC 2013**
50. **Jeffrey Knockel**, **George Saad** and Jared Saia, “Self-Healing of Byzantine Faults” *International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*, 2013.
51. Dieter Mitsche, **George Saad** and Jared Saia, “The Power of Mediation in an Extended El-Farol Game” *Symposium on Algorithmic Game Theory (SAGT)*, 2013.
52. Joud Houry, **Mahnush Movahedi**, Jared Saia and **Mahdi Zamani**, “Towards Provably-Secure Scalable Anonymous Broadcast”, *3rd USENIX Workshop on Free and Open Communications on the Internet (FOCI’13)*, 2013.
53. Varsha Dani, Valerie King, **Mahnush Mohavedi** and Jared Saia, “Brief Announcement: Breaking the $O(nm)$ Bit Barrier: Secure Multiparty Computation with a Static Adversary,” *Principles of Distributed Computing (PODC)*, 2012.
54. Seth Gilbert, Valerie King, Jared Saia, **Maxwell Young**, “Resource-Competitive Analysis: A New Perspective on Attack-Resistant Distributed Computing,” *International Workshop on Foundations of Mobile Computing (FOMC)*, 2012.
55. **Olumuyiwa Oluwasanmi** and Jared Saia, “Scalable Byzantine agreement with a Random Beacon,” *International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*, 2012.
56. Nicholas Aase, Jedidiah R. Crandall, Alvaro Diaz, **Jeffrey Knockel**, Jorge Ocana Molinero, Jared Saia, Dan Wallach, Tao Zhu, “Whiskey, Weed and Wukan on the World Wide Web: On Measuring Censors’ Resources and Motivations,” *USENIX Workshop on Free and Open Communications on the Internet (FOCI)*, 2012.
57. **Jeffrey Knockel**, Jedidiah R. Crandall and Jared Saia, “Three Researchers, Five Conjectures: An Empirical Analysis of TOM-Skype Censorship and Surveillance,” *USENIX Workshop on Free and Open Communications on the Internet (FOCI)*, 2011.
58. Valerie King, Jared Saia and **Maxwell Young**, “Conflict on a Communication Channel,” *Principles of Distributed Computing (PODC)*, 2011.
59. Varsha Dani, **Mahnush Movahedi**, **Yamel Rodriguez** and Jared Saia, “Scalable Mechanisms for Rational Secret Sharing,” *Principles of Distributed Computing (PODC)*, 2011.
60. Amos Fiat, Stefano Leonardi, Jared Saia and Piotr Sankowski, “Single Valued Combinatorial Auctions with Budgets,” *ACM Conference on Electronic Commerce*, 2011.
61. Valerie King, Steve Loneragan, Jared Saia, **Amitabh Trehan**, “Load balanced Scalable Byzantine Agreement through Quorum Building, with Full Information,” *International Conference on Distributed Computing and Networking (ICDCN)*, 2011.
62. Valerie King and Jared Saia, “Breaking the $O(n^2)$ Bit Barrier: Scalable Byzantine agreement with an Adaptive Adversary,” *Principles of Distributed Computing (PODC)*, 2010. **Best Paper Award.**
63. **Bo Wu**, Valerie King and Jared Saia, “Attack-Resistant Frequency Counting,” *IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, 2010.
64. **Olumuyiwa Oluwasanmi**, Valerie King and Jared Saia, “An Empirical Study of a Scalable Byzantine Agreement Algorithm,” *Heterogeneity in Computing Workshop (HWC)*, 2010.

65. Josep Diaz, Dieter Mitsche, **Navin Rustagi** and Jared Saia, "On the Power of Mediators," *Workshop on Internet and Network Economies (WINE)*, 2009.
66. Valerie King and Jared Saia, "Fast, scalable Byzantine agreement in the full information model with a nonadaptive adversary," *International Symposium on Distributed Computing (DISC)*, 2009.
67. Tom Hayes, Jared Saia and **Amitabh Trehan**, "The Forgiving Graph: A Self-Healing Distributed Data Structure," *Principles of Distributed Computing (PODC)*, 2009.
68. Valerie King and Jared Saia, "Brief Announcement: Fast Scalable Byzantine Agreement," *Principles of Distributed Computing (PODC)*, 2009.
69. Tom Hayes, **Navin Rustagi**, Jared Saia and **Amitabh Trehan**, "The Forgiving Tree: A Self-Healing Distributed Data Structure," *Principles of Distributed Computing (PODC)*, 2008.
70. Valerie King, Cynthia Phillips, Jared Saia and **Maxwell Young**, "Sleeping on the Job: Energy-Efficient Broadcast for Radio Networks," *Principles of Distributed Computing (PODC)*, 2008.
71. Bruce Kapron, David Kempe, Valerie King, Jared Saia and **Vishal Sanwalani**, "Fast Asynchronous Byzantine Agreement and Leader Election with Full Information," *Symposium on Discrete Algorithms (SODA)*, 2008.
72. Jared Saia and **Amitabh Trehan**, "Picking up the Pieces: Self-Healing in Reconfigurable Networks," in *IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, 2008.
73. Habiba, Tanya Berger-Wolf, **Yintao Yu**, Jared Saia, "Finding Spread Blockers in Dynamic Networks," *Proceedings of the 2nd ACM SIGKDD Workshop on Social Network Mining and Analysis (SNA-KDD)*, 2008.
74. James Aspnes, **Navin Rustagi** and Jared Saia, "Worm versus alert: Who wins in a battle for control of a large-scale network?," *International Conference of Principles of Distributed Systems (OPODIS)*, 2007.
75. Valerie King, Jared Saia, **Vishal Sanwalani** and Erik Vee, "Towards Secure and Scalable Computation in Peer-to-peer Networks," *Foundations of Computer Science (FOCS)*, 2006.
76. **Iching Boman**, Chaouki Abdallah, Edl Schamiloglu and Jared Saia, "Self-Healing Algorithms for Reconfigurable Networks," *International Symposium on Stabilization, Safety and Security of Distributed Systems (SSS)*, 2006.
77. Tanya Berger-Wolf and Jared Saia, "A Framework for the Analysis of Dynamic Social Networks," *Knowledge Discovery and Datamining (KDD)*, 2006.
78. Valerie King, Jared Saia, **Vishal Sanwalani** and Erik Vee, "Scalable Leader Election," *Symposium on Discrete Algorithms (SODA)*, 2006.
79. Amos Fiat, Jared Saia and **Maxwell Young**, "Making Chord Robust to Byzantine Faults," *European Symposium on Algorithms (ESA)*, 2005.
80. Valerie King and Jared Saia, "Choosing a Random Peer," *Principles of Distributed Computing (PODC)*, 2004.
81. **Scott Lewis** and Jared Saia, "Scalable Byzantine Agreement," *NIPS Workshop on Robust Communication Dynamics in Complex Networks*, 2003.
82. Amos Fiat and Jared Saia, "Censorship Resistant Peer-To-Peer Content Addressable Networks," *Proceedings of the 13th Annual Symposium on Discrete Algorithms*, San Francisco, California, 2002. **In the top 200 most cited computer science papers published in 2002 according to citeseer.**
83. Jared Saia, Stefan Saroiu, Amos Fiat, Steve Gribble, and Anna R. Karlin, "Dynamically Fault-Tolerant Content Addressable Networks," *First International Workshop on Peer-to-Peer Systems*, 2002.

84. Joe Hall, Jason Hartline, Anna R. Karlin, Jared Saia and John Wilkes, “On Algorithms for Efficient Data Migration,” *Proceedings of the 12th Annual Symposium on Discrete Algorithms (SODA)*, 2001.
85. Yosi Azar, Amos Fiat, Anna Karlin, Frank McSherry and Jared Saia, “Spectral Analysis of Data,” *Thirty-Third Annual ACM Symposium on Theory of Computing (STOC)*, 2001.
86. Eric Anderson, Joe Hall, Jason Hartline, Michael Hobbes, Anna Karlin, Jared Saia, Ram Swaminathan and John Wilkes, “An Experimental Study of Data Migration Algorithms,” *Proceedings of the 5th Workshop on Algorithm Engineering*, 2001.
87. Bernard M.E. Moret, Michael Collins, Jared Saia and Ling Yu, “The Ice Rink Problem,” *Proceedings of the 1st Workshop on Algorithm Engineering*, 1997.
88. Zhiqiang Chen, Andrew Holle, Bernard M.E. Moret, Jared Saia and Ali Boroujerdi, “Network Routing Models Applied to Aircraft Routing Problems,” *Proceedings of the Winter Simulation Conference*, 1995.
89. Osamu Furuse, Hitoshi Iida, Kozo Oi, Jared Saia and Eiichiro Sumita. “A Massively Parallel Association Approach For Real Time Spoken Language Translation Systems,” *Proceedings of the Japanese Parallel Processing Conference*, 1994. **Winner of Japanese Society for Artificial Intelligence “Excellence in Research” Award**

Chapters of Books

90. “Randomization in Distributed Computing” in *Encyclopedia of Algorithms*, Springer Publishing, 2007.
91. “Statistical Natural Language Processing” (pp. 543-550) in “Artificial Intelligence, Structures and Strategies for Complex Problem Solving - Third Edition” by George Luger and William Stubblefield, Addison Wesley Longman Inc., 1998.

Articles in Newsletters

92. Valerie King and Jared Saia, “Scalable Byzantine Agreement,” *ACM SIGACT News*: 41(3): 89-107, 2010.
93. Michael Bender, Jeremy Fineman, **Mahnush Movahedi**, Jared Saia, **Varsha Dani**, Seth Gilbert, Seth Pettie, and Maxwell Young, “Resource-Competitive Algorithms”, *ACM SIGACT News*: 46(3): 51-71, 2015.

Funding

The dollar amount listed with each grant is the UNM share for that grant. The sum of the UNM share for these grants exceeds \$4.2 million.

1. NSF CNS 2210299 (\$300,000), “Collaborative Research: SaTC: CORE: Small: Bankrupting Attackers in Dynamic Networks”, PI: Jared Saia, CO-PI: Maxwell Young, 2022-2025.
2. NSF 2024520 (\$1,495,437) “NRI: INT: Adaptive Bio-inspired Co-Robot algorithms for volcano monitoring”, PIs: Melanie Moses, Rafael Fierro, Jared C Saia, George M Fricke, Tobias P Fischer, 2020-2024.
3. Sandia Labs Contract (\$16,000) “Information-Theoretically-Secure Distributed Machine Learning”, UNM Contractor: J. Saia, 2020-2021.
4. Sandia Labs Contract (\$16,000) “Information-Theoretically-Secure Distributed Machine Learning”, UNM Contractor: J. Saia, 2018-2019.
5. NSF 1816250 (\$250,981) “SaTC: CORE: Small: Collaborative: Proof of Work Without All the Work”, PIs: J. Saia, M. Young 2018-2021.

6. Sandia Labs Contract (\$147,166) “Cyber Graph Queries for Geographically Distributed Data Centers”, UNM Contractor: J. Saia, 2012-2014.
7. NSF AF (\$399,999) “Quorums Quicken Queries - Towards Practical Secure Multiparty Computation”, PI: J. Saia, 2013-2016.
8. NSF TWC (\$249,801) “Cost-Competitive Analysis- A New Tool for Designing Secure Systems”, PIs: J. Saia, S. Pettie, 2013-2016.
9. NSF REU Supplement (\$17,069) “Computing without a Leader: Building Blocks for Internet-Scale, Robust Computing,” PI: J. Saia, 2012.
10. NSF CISE (\$365,710) “Computing without a Leader: Building Blocks for Internet-Scale, Robust Computing,” PI: J. Saia, 2011-2014.
11. IARPA (\$202,500) “Analysis and Mitigation of Internet Censorship,” PI: J. Saia; co PIs: J. Crandall, J. Karlin, 2011-2012.
12. Air Force Office of Scientific Research, DURIP-10-054 (\$58,189) “Helix Project Testbed: Towards the Self-Regenerative Incorruptible Enterprise,” PI: J. Knight; co-PIs: J. Davidson, D. Evans, W. Weimer, A. Nguyen-Tuong, H. Chen, K. Levitt, J. Rowe, Z. Su, F. Wu, F. Chong, S. Forrest, J. Saia, 2010.
13. Army Research Lab (\$100,000), “Developing a Science of Cybersecurity,” PI: J. Katz; co-PIs: W. Arbaugh, J. Saia, 2011-2012.
14. NSF CNS (\$299,732), “Beyond Tit-for-Tat: New Techniques for Collaboration in Network Security Games,” PI: J. Saia, 2010-2013.
15. NSF CNS (\$400,000), “CAREER: Foundations for Attack-Resistant, Collaborative Peer-to-peer Systems,” PI: J. Saia, 2007-2012.
16. NSF IIS (\$294,863) “Collaborative Research: Computational Methods for Understanding Social Interactions in Animal Populations,” PI: T. Berger-Wolfe; co-PIs: D. Rubenstein, J. Saia, 2007-2010.
17. Air Force Office of Scientific Research MURI (\$750,000) “Helix: A Self Regenerative Architecture for Incorruptible Enterprise,” PI: J. Knight; co-PIs: J. Davidson, D. Evans, W. Weimer, A. Nguyen-Tuong, H. Chen, K. Levitt, J. Rowe, Z. Su, F. Wu, F. Chong, S. Forrest, J. Saia, 2007-2012.
18. NSF CCF (\$340,000), “ITR: Attack-Resistant Peer-to-peer Networks,” PI: J. Saia, 2003-2006.
19. Sandia Labs (\$80,000), “Scalable, Attack-Resistant Peer-to-peer Networks”, PI: J. Saia, 2002-2004.

Keynote Talks at Conferences

“Proof-of-work Without all the Work” at the *27th International Colloquium on Structural Information and Communication Complexity (SIROCCO)*, Paderborn, Germany 2020.

“Truth, Lies and Random Bits”, in the Foundations of Computer Science track at the *41st International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM)*, Ped Pod Snezkou, Czech Republic, 2015.

Invited Talks at Workshops, Universities and Labs

7th Workshop on Biological Distributed Algorithms (BDA), “A Most Irrational Foraging Algorithm”, Toronto, ON, 2019.

Shenzhen Blockchain Workshop, Shenzhen China, “Proof of Work Without All the Work” 2017.

Security Group, Cornell University, “Proof of Work Without All the Work” 2017.

Oxford University, Oxford England, “Interactive Communication in Large Networks”, 2016.

Loughborough University, Loughborough England, “Interactive Communication in Large Networks”, 2016.

MIT Lincoln Laboratory “Clustering Coefficients and the Dunbar Number”, 2016.

Sandia Labs Livermore Campus, Invited Talk “Clustering Coefficients and the Dunbar Number” 2016.

Sixth Bertinoro Workshop on Algorithms and Data Structures, Bertinoro Italy, “Scalable Interactive Communication”, 2016.

Oak Ridge National Labs, Computer Science and Mathematics Division, “Reliability in Distributed Computing and High Performance Computing”, 2013.

Santa Fe Institute, “Truth, Lies and Random Bits,” 2013.

Fifth Bertinoro Workshop on Algorithms and Data Structures, Bertinoro Italy, “A Spectral Method for Detecting Malicious Behavior” 2013.

Institute for Computing in Science (ICiS) workshop on Future of the Field of High Performance Computing, 2012.

Banff International Research Station (BIRS) Workshop on “Probabilistic versus Deterministic Approaches to Shared Memory Computation”, 2012.

Fourth Bertinoro Workshop on Algorithms and Data Structures, Bertinoro Italy, “Scalable, Rational Secret Sharing,” 2011.

University of Iowa Invited Lecture Series, “Scalable Byzantine Agreement,” 2011.

Santa Fe Institute Summer School, “Distributed Computing,” 2011.

Santa Fe Institute, “Conflict in Communication Games,” 2010.

Information Theory and Applications (ITA) Workshop, San Diego “Fear in Mediation: Exploiting the Windfall of Malice,” 2010.

Third Bertinoro Workshop on Algorithms and Data Structures, Bertinoro Italy, “Fear in Mediation: Exploiting the Windfall of Malice,” 2010.

Yahoo Research, Barcelona, Spain, “Conflict in Networks,” 2008.

Dynamic Communication Networks Foundations and Algorithms (DYNAMO) Workshop, Arcachon, France, “Worm vs Alert,” 2008.

Santa Fe Institute Workshop on Scaling in Biological and Social Networks, “Worm vs Alert,” 2007.

University of California, Davis, “Building a Computer out of the Internet: Foundations for Collaborative Computation,” 2007.

University of Maryland, “Conflict on Large Networks,” 2007.

Microsoft Research Labs Networking Group, Redmond, WA, “Asynchronous Byzantine Agreement in Polynomial Time,” 2006.

University of Illinois in Chicago, “Secure Algorithms and Data Structures for Massive Networks,” 2005.

University of Barcelona, Spain, 2005.

CSRI Group, Sandia Labs, 2005.

Los Alamos Labs, 2005.

Santa Fe Institute Workshop on New Perspectives on Complex Systems, 2005.

Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers NJ, “Choosing a Random Peer,” 2004.

University of Maryland, 2004.

University of Southern California, 2004.

University of Tel Aviv, Tel Aviv, Israel, 2004.

NIPS Workshop on Robust Communication Dynamics in Complex Networks, Vancouver, “Scalable Byzantine Agreement,” 2004.

Dartmouth College, University of Minnesota, Emory University, University of Florida, University of Victoria, and University of Georgia, “Censorship-Resistant Peer-to-peer Networks,” 2002.

Conferences Chaired

Co-chair, International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS), 2018.

Co-chair, International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS), 2014.

Workshops Chaired

Co-Organizer PODC Workshop on Security in Permissionless Systems (SPS), 2019

Co-Organizer, Banff International Research Station for Mathematical Innovation and Discovery (BIRS) workshop on Foundations for a Distributed Ledger, 2020

Co-chair, First Annual Workshop on Competitive Economics of Cybersecurity (CEC), Sandia Labs, 2018.

Co-chair, 10th ACM International Workshop on Foundations of Mobile Computing (FOMC), 2014.

Co-chair, SIAM International Conference on Data Mining (SDM): Workshop on Analysis of Dynamic Networks (ADN), 2009.

Co-chair, International Conference on Data Mining (ICDM): Workshop on Analysis of Dynamic Networks (ADN), 2008.

Program Committees

Program Committee, Principles of Distributed Computing (PODC), 2021, 2020, 2015, 2011, 2006, 2005.

Program Committee, International Conference on Distributed Computing Systems (ICDCS), 2020, 2012, 2011.

Program Committee, Symposium on Theory of Computing (STOC), 2017.

Program Committee, Symposium on Discrete Algorithms (SODA), 2012.

Program Committee, International Conference on Automata, Languages and Complexity (ICALP), 2014.

Program Committee, International Symposium on Distributed Computing (DISC), 2014.

Program Committee, IEEE International Parallel and Distributed Processing Symposium (IPDPS) - Algorithms Track, 2014, 2010, 2009, 2008.

Program Committee, International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS), 2019, 2012.

Program Committee, International Conference on Algorithms and Complexity (CIAC), 2010.

Program Committee, Symposium on Parallel Algorithms and Architecture (SPAA), 2010.

Program Committee, ACM/SIGMOBILE Annual International Joint Workshop on Foundations of Mobile Computing (DIALM-POMC), 2004.

Panels and Reviewing

Panelist for National Science Foundation proposal review panel, 2017, 2016, 2015, 2014, 2007, 2006, 2004, 2005.

I have reviewed manuscripts for the following journals and conferences: *Symposium on the Theory of Computation (STOC)*, *Foundations of Computer Science (FOCS)*, *Principles of Distributed Computing (PODC)*, *Symposium on Discrete Algorithms (SODA)*, *International Colloquium on Automata, Languages and Programming (ICALP)*, *Symposium on Parallel Algorithms (SPAA)*, *Symposium on Distributed Computing (DISC)*, *Joint Conference of the IEEE Computer and Communications Societies (InfoComm)*, *Journal of Experimental Algorithms (JEA)*, *Journal of Algorithms (JOA)*, *Journal of Computing (JOC)*, *Journal of Distributed Computing (JODC)*, *Journal of Networking (JON)*, and *IEEE Transactions on Computing*.

Graduate Students and Post Docs

For each student and post doc, the first position after graduation from UNM CS is listed (when known) after their graduation date.

Post Docs

1. Varsha Dani - 2013-2015, currently Research Faculty at UNM CS Department.

PhD - Graduated

1. Diksha Gupta, Dissertation Title: “Sybil Defense using Efficient Resource Burning”, 2021. Post Doc at National University of Singapore (NUS).
2. Abhinav Aggarwal, Dissertation Title: “Thwarting Adversaries using Randomness and Irrationality”, 2019. Senior Researcher at Amazon.
3. Jeffrey Knockel (co-advised with Jed Crandall), Dissertation Title: “What companies’ unabridged keyword blacklists say about Chinese censorship of realtime chat”, 2018. Researcher at The Citizen Lab, Munk School of Global Affairs, University of Toronto.
4. Mahdi Zamani, Dissertation Title: “Scalable and Robust Algorithms for Privacy-Preserving Applications”, 2016. Post Doc at Yale University; now Senior Research at DFINITY.
5. Mahnush Movahedi, Dissertation Title: “Scalable Secure Multi-Party Computation”, 2016. Post Doc at Yale University; now Research Scientist at Visa Research.
6. George Helmy Saad, Dissertation Title: “Selfishness and Malice in Distributed Systems”, 2015. Senior Software Engineer at Jasper.
7. Olumuyiwa O. Oluwasanmi, Dissertation Title: “Practical, Scalable Algorithms for Byzantine Agreement,” 2011. Process Engineer at Intel Corporation.
8. Navin Rustagi, Dissertation Title: “Security in Network Games,” 2010. Postdoc at Rice University.
9. Amitabh Trehan, Dissertation Title: “Algorithms for Self-Healing Networks,” **Winner of the UNM Dean’s Dissertation Award**, 2010. Postdoc at Technion University. Tenure-track position at Loughborough University, UK.
10. Vishal Sanwalani (co-advised with Cris Moore), Dissertation Title: “Applications of the Probabilistic Method to Random Graphs,” 2005. Post Doc at the University of Waterloo.

PhD - Current

1. Abir Islam, expected graduation 2025.

MS - Graduated

1. Aaron Kearns, 2016. Albuquerque Seismic Lab.
2. Jenny Chen, 2014. Software company in Silicon Valley.
3. Yamel Rodriguez, 2010. Financial technology company in Mexico City.
4. Bo Wu, 2009. Microsoft Corporation.
5. Vikrant Gaur, 2007. Rockwell Collins.
6. IChing Chang Boman (with distinction), 2006. Gigablast.
7. Maxwell Young (with distinction), 2006. PhD at University of Waterloo. Currently has tenure-track position at Drexel University.
8. Jake Proctor (with distinction), 2005. Sandia Labs.
9. John Alphonse, 2005. Microsoft Corporation.
10. Florina Cazaku, 2004. Waters Software.

Undergraduate

1. Abigail Soward, Summer 2018.
2. Joe Collard, 2011-2013. PhD at University of Massachusetts, Amherst.
3. Charlie Clauss, 2012-2013.
4. David De Francisco, 2007-2008. MS at Stanford University.
5. Yintao Yu, 2007-2008. PhD at University of Illinois, Urbana-Champaign.

Press Coverage

“Proof of Work without All the Work” in *YCombinator Hacker News*, 8/7/17.

“Research Scientist Delves into Problem of Persuading Millions of People to Cooperate for a Secure Internet” in *ACM Technical News*, *UNM Today*, Sept. 2010.

“Social Networking Software Tracks Zebras and Consumers”, in *Washingtonpost.com*, *ACM Technical News*, *Newswise Website*, *FOREX Trading*, *Healthcare Industry Today*, and *Ecademy Daily News*, 9/6/07 - 9/10/07

“Professor Fights a Mathematical Battle to Keep the Virtual World Running Smoothly”, *ACM Technical News*, 2/26/07 and *UNM Today*, 2/27/07

“Professor Goes to War,” *Front page lead article in University of New Mexico Daily Lobo*, 3/2/07

Courses Taught

CS 591, “Bitcoins, Blockchains and Beyond”, S’ 2019.

CS 591, “Game Theory and Social Computing”, S’ 2011.

CS 591, “Algorithms in the Real World”, F’ 2002

CS 561, “Data Structures and Algorithms”, F’ 2006, F’ 2007, F’ 2009, F’ 2010, F’ 2011, F’ 2012, F’ 2013, F’ 2014.

CS 511, “Cybersecurity: A Theoretical Approach”, S’ 2006, F’ 2007

CS 510, “Randomized Algorithms”, F’ 2004, S’ 2007

CS 506, “Computational Geometry”, S’ 2017, 2020

CS 4/527 “Introduction to Artificial Intelligence”, S’ 2008

CS 362, “Data Structures and Algorithms II”, S’ 2007, S’ 2006, S’ 2005, F’ 2004, F’ 2003

CS 361, “Data Structures and Algorithms”, F’ 2005, S’ 2004, S’ 2003

CS 261, “Mathematical Foundations of Computer Science”, S’2010, S’ 2019.

Courses Taught Elsewhere

“Conflict in Networks,” at Universitat Politècnica de Catalunya, 10 lecture course taught in the fall of 2008.

“Conflict in Networks,” at Università di Roma Sapienza, 5 lecture course taught in the spring of 2009.

Internal Service

Member Hiring Committee, 2017-2018.

Head of Promotion and Tenure Committee, 2014, 2015, 2016, 2019.

Associate Chair of UNM Computer Science Department, 2011-2013.

Member School of Engineering Promotion and Tenure Committee, 2013-2015.

Co-organizer of department colloquia, and organizer of joint UNM/Sandia distinguished lecturer series, 2007-2008 and 2010-2011.

Headed graduate student recruiting committee; Created a one page flyer: “CS@UNM, Our Alumni Speak for Themselves,” featuring quotes from several of our successful alumni; disseminated flyer to over 100 CS programs, 2010-2011.

Head graduate admissions committee, 2011-2012; Member graduate admissions committee 2003-2007.

Headed committee to change comprehensive exam for UNM CS Masters students; revamped course requirements and added new oral exam requirements, 2008.

Member Promotion and Tenure Committee, 2009-2010 and 2012-2013.

Primary organizer and creator of CS Recruitment Day for over 100 local high school students; event included research demos, videos, short talks, and a goody bag, 2006-2007.

Founded and ran orientation day for new PhD and Masters students, 2003-2007.

Headed graduate recruiting efforts for UNM CS; personally contacted top applicants to department, set up peer recruiting program, and organized visits, 2003-2006; Organized first official prospective grad student visit event, 2006.

Edited, designed and arranged publication of the first brochure for UNM CS department, 2005.

Created first department recruiting video for UNM CS department; video included interviews with current faculty, graduate and undergraduate students, 2006.

Headed PhD written comprehensive exam committee, 2012. Member PhD written Comprehensive Examination Committee, 2002-present.